20-119-1-11/52

AUTHOR: Yagn, Yu.I., Shishmarev, O.A.

TITLE: Some Results of the Investigation of the Limit of the Elastic State of Plastically Stretched Pieces of Nickel (Nekotoryye rezul'taty issledovaniya granits uprugogo sostoyaniya plasticheski rastyanutykh obraztsov nikelya)

PERIODICAL: Doklady Akademii Nauk, 1958, Vol 119, Nr 1, pp 46-48 (USSR)

ABSTRACT: The authors describe the results of their experimental investigation of the limit of the elastic state for a plane state of tension which was generated by a stretching and torsion of thin-walled nickel tubes. A high exactness was aspired. The exterior diameter of the tubes was 5 mm for a thickness of the wall of 0,2 mm. The experiments were carried out under a direct load by weights, the measurements were made by mirror instruments. The determination of all points of the sought limit at a piece of the tube was inexact because of the remaining action of preceding experiments. It is stated that reliable measurements are possible only ca. 10-15 minutes after the plastic deformation, because before this time the creeping is too large. On none of the obtained limits the authors found angles, the existence of which is asserted by many authors [Ref 3,5,6].

Some Results of the Investigation of the Limit of the Elastic State of Plastically Stretched Pieces of Nickel 20-119-1-11/52

There are 6 references, 2 of which are Soviet, 4 American.

PRESENTED: October 17, 1957, by L.I.Sedov, Academician
SUBMITTED: October 14, 1957

Card 2/2

SHISHMAREV, O.A., Cand Tech Sci -- (diss) "Study of the ~~limit~~ boundary of the elastic state of ~~xx~~ nickel ~~test pieces~~ specimens for certain methods of ~~charge~~ load." Len, 195?, 13 pp (Min of Higher Education USSR. Len Polytechnical Inst im M.I. Kalinin) 150 copies (KL, 26-59, 129)

SHISHMAREV, O.A (Kaliningrad); KUZ'MIN, Ye.Ya. (Kaliningrad)

Dependence of elastic constants of a metal on plastic deformations. Izv.AN SSSR.Otd.tekh.nauk.Mekh.i mashinostr. no.3:167-169 My-Je '61. (MIRA 14:6)

(Deformations (Mechanics)) (Metals--Testing)

SHISHMAREV, O.A. (Kaliningrad)

Studying the yield limit area opposite the load point. Izv.AN SSSR.Otd.tekh.nauk.Mekh. i mashinostr. no.4:159-164 Jl-Ag '62. (MIRA 15:8)

(Metals—Testing)

SHISHMAREV, O.A. (Kalingrad)

Investigating the yield point for plastically deformed nickel specimens. Inzh.zhur. 3 no.4:740-747 '63. (MIRA 16:12)

SHISHMAREV, O. A. (Kaliningrad)

"An experimental verification of the postulates of isotropy and delay and the yield surface under complex loading"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 January - 5 February 1964.

S/536/61/000/052/005/008
D201/D301

13,2520

AUTHORS: Urazayev, Z.F., Candidate of Technical Sciences, and Shishmarev, V.Yu., Engineer

TITLE: Quality of a special fluid filling of loating gyroscopic instruments

SOURCE: Moscow. Aviatsionnyy tekhnologicheskiy institut. Trudy, no. 52, 1961. Nekotoryye voprosy sovremennoy tekhnologii priborostroyeniya, 52-60

TEXT: The term 'quality of filling' is defined as the amount of residual air bubbles left in the housing of a floating gyroscopic instrument after filling with a special fluid to reduce the total amount of friction in its bearings. The authors consider the effects of air bubbles on the gyro errors and describe a special installation and method of filling. The apparatus has a bellows type thermostat with two visual indicators of the bellows pressure. The indicators are arranged so that the difference in their readings, i.e. the reading of vacuum during the filling process and of atmospheric pressure restored after it had been finished, determines accurately

Card 1/2

L 12615-65 EEO-2/EWT(d)/FSS-2/EWT(1)/EWT(m)/EEC(k)-2/EWG(v)/EED-2/FS(b)
Pn-4/Po-4/Pe-5/Pg-4/Pk-4/Pl-4/Pq-4 JD/BC
ACCESSION NR: AT4046039 S/2536/64/000/059/0091/0110

AUTHOR: Shishmarev, V. Yu.

TITLE: Effect of the parameters of the electrical power supply on the accuracy of angular velocity transducers

SOURCE: Moscow. Aviatsionny*y tekhnologicheskiy institut. Trudy*, no. 59, 1964. Tekhnologiya i konstruirovaniye giropriborov (Technology and design of gyroscopic instruments), 91-110

TOPIC TAGS: aircraft instrumentation, gyroscopic instrument, power supply, angular velocity, angular velocity transducer, electrical spring

ABSTRACT: Angular velocity transducers consist of a gyroscope with two degrees of freedom which is provided with a device which, when the gyroscope frame deviates from its initial position, applies to it a moment, proportional to the angle of deviation of the frame, which tends to return the frame to its initial position. A schematic diagram of such a transducer is shown in Fig. 1 of the Enclosure. This moment can be produced either by mechanical springs or by a special system which is called an "electrical spring". The present paper describes a transducer with a potentiometric output in which the

Card 1/4

opposing moment is obtained by mechanical springs. On the basis of a mathematical analysis, the following conclusions are reached: 1. The output signal of a transducer having a mechanical spring is directly proportional to the voltage applied to the potentiometer. 2. When the supply voltage to the gyrometer varies within the limits ± 5%, the magnitude of the output signal is practically directly proportional to the voltage and varies within the limits ± 0.84% about its mean value, corresponding to the nominal value of the supply voltage. 3. When the supply voltage frequency oscillates within the limits ± 2%, the magnitude of the output signal is practically directly proportional to the frequency and changes within the limits ± 1.4% of the value for the nominal supply frequency. 4. The ranges of tolerance for voltage and frequency can be computed, using two formulas derived in the paper, on the basis of a given range of tolerance for the speed of the gyromotor. 5. In order to obtain a high accuracy in such a transducer it is necessary to impose stringent requirements on the supply sources (particularly the supply frequency stability). 6. In order to estimate the quality of production of such instruments, it is recommended to use the concept of the "accuracy of production" as distinguished from the "accuracy of the instrument", and to measure the output parameters of instruments at nominal supply parameters which must be controlled during measurements by high precision meters. Orig. art. has: 96 formulas, 7 figures, and 2 tables.

L 12615-65
ACCESSION NR: AT4046039

ASSOCIATION: Moskovskiy aviatsionny*y tekhnologicheskiy institut (Moscow Institute of Aviation Technology)

SUBMITTED: 00 ENCL: 01 SUB CODE: EE, NG

NO REF SOV: 002 OTHER: 000

Card 3/4

L 8661-65 EEO-2/EWT(d)/EWT(l)/EWT(m)/EDC-4/EED(b)-2/EWA(h) Pn-4/Pa-4/Po-4/Pu-4/
Pg-4/Peb/Pk-4/Pl-4 SSD/AFETR/ESD/APGC/AFWL/ESD(dp)/ASD(a)-5/ASD(a)/ESD(t)/AEEM(t)
ACCESSION NR: AT4046040 JD/HC S/2536/64/000/059/0111/0137

AUTHOR: Urazayev, A.F., Shishmarev, V. Yu. B

TITLE: Increasing the reliability and accuracy of potentiometers used in gyroscopic instruments

SOURCE: Moscow. Aviatsionny*y tekhnologicheskiy institut. Trudy*, no. 59, 1964. Tekhnologiya i konstruirovaniye giropriborov (Technology and design of gyroscopic instruments), 111-137

TOPIC TAGS: potentiometer, gyroscope, gyro instrument, potentiometer design, aircraft instrumentation, electrical contact, autopilot

ABSTRACT: The authors briefly review the modern theory of instrument reliability and discuss the use of potentiometers in aircraft instruments in detail from this viewpoint. It is pointed out that the most vulnerable element in a potentiometer is the electrical contact between the potentiometer winding and the wiping contact. Contact failure is the most serious reliability problem in automatic pilot instrumentation. The design of a reliable contact is therefore discussed in detail and a few design examples are described. The possibility of increasing the reliability by providing a second parallel contact is examined and its effect on the potentiometer performance and error is illustrated by

Card 1/3

L 8681-65
ACCESSION NR: AT4046040

specific examples. The reasons for contact failure are discussed, and the case when two parallel contacts are used, one of which is displaced with respect to the other by either one turn or a half a turn of the potentiometer winding, is examined in detail. In the first case, one turn between the contacts is shorted and this has no effect with windings having more than 1000 turns since the tolerance in the winding is usually greater than ± 1 turn. The characteristic, resolution (defined as the variation of resistance or voltage at the contact when the contact is displaced by one turn) and accuracy of such a potentiometer is also practically unaffected. When the contacts are shifted by half a turn with respect to each other, the accuracy of such a potentiometer is increased in its middle range by a factor of two. The theoretical conclusions concerning the relative displacement of two parallel contacts were corroborated experimentally. The agreement between theoretical and experimental characteristics obtained confirms the validity of the proposed method of decreasing the winding error of potentiometers in their middle range by displacing two parallel wiping contacts by half of the distance between the turns. A detailed examination of the characteristic of a potentiometer which has two diametrically opposed parallel wiping contacts shows that the resolution and the winding error decreases by a factor of two throughout the entire potentiometer length compared with

Card 2/3

L 8681-65
ACCESSION NR: AT4046040

a potentiometer whose wiping contacts are not displaced with respect to each other. To ensure an accurate and stable relative position of the contact points of two parallel wiping contacts, a new wiping contact design is proposed and illustrated. Orig. art. has: 24 formulas, 16 figures and 2 tables.

ASSOCIATION: Moskovskiy aviatsionnyy tekhnologicheskiy institut (Moscow Institute of Aviation Technology)

SUBMITTED: 00 ENCL: 00 SUB CODE: EC, NG

NO REF SOV: 000 OTHER: 000

Card 3/3

ACCESSION NR: AT4046041 S/2536/64/000/059/0138/0168

AUTHOR: Shishmarev, V. Yu. (Engineer); Zakharova, L. I. (Engineer); Urazayev, Z.F. (Candidate of technical sciences)

TITLE: A method of designing current-carrying wipers for potentiometers used in gyroscopic instruments

SOURCE: Moscow. Aviatsionny*y tekhnologicheskiy institut. Trudy*, no. 59, 1964. Tekhnologiya i konstruirovaniye giropriborov (Technology and design of gyroscopic instruments), 138-168

TOPIC TAGS: gyroscope, gyro instrument, gyro potentiometer, potentiometer brush, commutator brush, wiper design, potentiometer wiper, electrical contact

ABSTRACT: The main shortcoming of potentiometers is the low reliability of the contact at the point where the wiper touches the potentiometer winding. This paper examines the effect of wiper parameters on the reliability of potentiometric transducers, and proposes a method for designing current-carrying wipers. The effect of the contact pressure of wipers is examined in detail. Formulas for the minim al contact pressure assuring a reliable contact pressure are derived. For contacts between noble metals the contact pressure should be between 0.2 and 1.2G. The problem of the constancy of the contact

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ACCESSION NR: AT4046041

pressure with time is investigated. In this connection, it is noted that for small objects like wipers the effect of internal stresses due to thermal and mechanical processing can be relatively large. The effect of the natural frequency of oscillation of a wiper or the wiper assembly on the reliability of contact is examined, and it is concluded that the frequency of natural oscillation of a wiper must be about twice as high as the maximum frequency of the vibrations actually occurring. On the basis of the above considerations a method for designing the main parameters of wipers is developed which takes into account given operating conditions such as vibration and overload; in this design method a wiper is considered as a beam, one end of which is fixed and the other end of which, the point of contact, is considered to be supported on rollers. Design formulas are derived for arm-type wipers of constant circular cross-section having a flattened segment near the mounting place. The design formulas derived are conveniently summarized in a Table, and their use is illustrated in specific examples. The method shows that for given operating conditions and material the magnitude of the desired contact pressure uniquely determines the optimum value of the wiper diameter and length. The operating conditions as well as the wiper metal uniquely determine the optimum magnitude of the

Card 2/3

ACCESSION NR: AT4046041

wiper bend inflection to be used. Following this design method the reliability of potentiometric transducers and, consequently, of the instruments where they are used, will be increased. The method proposed can also be employed to design other types of current-carrying wipers like commutator brushes, elastic parts of central contacts, etc. Orig. art. has: 106 formulas, 19 figures, and 5 tables.

ASSOCIATION: Moskovskiy Aviatsionny*y tekhnologicheskiy institut (Moscow Institute of Aviation Technology)

SUBMITTED: 00 ENCL: 00 SUB CODE: EE, NG

NO REF SOV: 003 OTHER: 000

Card 3/3

SOV/121-58-10-12/25

AUTHORS: Shishmareva, L.B.,
Yakovleya, O.Ya.,
Bur'yanenko, V.N.

TITLE: The Phosphate Treatment of Ferrous Metals
(Fosfatirovaniye chernykh metallov)

PERIODICAL: Stanki i Instrument, 1958, Nr 10, pp 32-33 (USSR)

ABSTRACT: Phosphate coatings for ferrous metals as a base for paint are discussed. Compositions of phosphate treatment solutions are listed. Composition No.1 contains per litre 38 g of zinc monophosphate, 76 g of $NaNO$, 2.7 g of sodium fluoride, 5 g of iron shavings. Total acidity 28-30 points, free acidity 2.7 - 3 points, suitable for bath and spray treatment at 82°C. Composition No.2 contains 30 g "Mazhef" salt (mixture of monophosphates namely manganese monophosphate, $Mn(H_2PO_4)_2$ and iron monophosphate $Fe(H_2PO_4)_2$), 60 g zinc nitrate, 4-5 g sodium nitrate, 0.1 - 1.0 g phosphoric acid. Total acidity 36-41 points, free acidity 3-5 points, suitable for bath treatment only at 40-50°C. Composition No.3 contains 100 g zinc monophosphate, 2 g sodium nitrate and 6 g sodium fluoride.

Card 1/2

The Phosphate Treatment of Ferrous Metals

Composition No.4 contains 50 g of "Manzhef" salt, 92 g zinc nitrate, 3 g sodium fluoride, total acidity 65-72 points, free acidity 3.1 - 3.4 points. The last two compositions can be applied in a bath or by brushing on or covering with paste. The phosphate treatment must be followed by painting with laqueur or impregnating with lubricating material within a week

SHISHMAREVA, L.B.

Modern methods of treating the surface of articles from ferrous metals prior to painting, and their introduction into the practice of the Gorkiy Automobile Plant. Lakokras.mat. i ikh prim. no.1: 46-49 '60. (MIRA 14:4)

1. TSentral'naya nauchno-issledovatel'skaya laboratoriya Vsesoyuznoy proizvodstvennoy kontory "Lakokraspokrytiye."
(Automobiles--Painting)

SHISHMAREVA, L.B.; BUR'YANENKO, V.N.

Preparations for the simultaneous etching and degreasing of nonferrous metals before coloring. Lakokras. mat. i ikh prim. no. 6:45-48 '60. (MIRA 13:12)
(Nonferrous metals--Finishing)

SHISHMAREVA, L.B.; DINERSHTEYN, P.A.

Painting of metallic and wood items with heated lacquers and enamels. Lakokras.mat.i ikh prim. no.3:41-44 '60. (MIRA14:4)
(Painting, Industrial)

L 32038-66 EWT(d)/EWT(m)/EWP(w)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/HW/EM/DJ

ACC NR: AP6018948 SOURCE CODE: UR/0126/66/021/006/0910/0914

AUTHOR: Kolmogorov, V. L.; Shishmintsev, V. F.

ORG: Ural Scientific Research Institute for Ferrous Metals (Ural'skiy NII chernykh metallov)

TITLE: Dependence of steel ductility on hydrostatic pressure

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 6, 1966, 910-914

TOPIC TAGS: steel, carbon steel, alloy steel, ball bearing steel, stainless steel, steel ductility, hydrostatic pressure, pressure effect/30 KhGSA steel, ShKh15 steel, Kh18N10T steel

ABSTRACT: Experiments have been made to determine the quantitative relationship between the ductility of metals, particularly of steels, and the stress conditions. The σ/T ratio, where σ is the mean hydrostatic pressure equal to $1/3(\sigma_1 + \sigma_2 + \sigma_3)$, and T is the magnitude of shear stress, was used as an index characterizing the stress condition. The shear stress (Λ_f) corresponding to the beginning of the failure of metal was used to characterize the metal ductility. Specimens of hot-rolled steel 20, steel 40, 30KhGSA low-alloy steel, ShKh15 ball bearing steel, and Kh18N10T stainless steel were subjected to standard tensile and bend tests, compression tests at atmospheric and hydrostatic pressures of 2000 atm, and hydrostatic extrusion (with a high-pressure fluid). On the basis of the experimental results, formulas were

Card 1/2 UDC: 539.374

L 32038-66

ACC NR: AP6018948

derived and graphs plotted for the dependence of the shear deformation at metal failure on the relative hydrostatic pressure. Compression stresses increased the ductility of all investigated steels, but the changes in ductility with changing stress conditions were not the same in different steels. A change in the relative hydrostatic pressure (σ/T) from +2.0 to -2.0 increased the ductility by 2 to 10 times; 30KhGSA steel exhibited the greatest and Kh18N10T steel, the smallest increase. In hydrostatic tension ($\sigma/T = +2$) the former was the least and the latter the most ductile. Hence, the ductility of a metal under certain stress condition does not characterize the ductility of the same metal in another, substantially different, stress conditions. In contrast to other steels, Kh18N10T steel exhibited an anomaly: a low rate of ductility increase with increasing mean hydrostatic pressure (σ/T). [MS]

Orig. art. has: 1 figure, 1 table, and 11 formulas.

SUB CODE: 13, 11/ SUBM DATE: 10May65/ ORIG REF: 008/ OTH REF: 002/ ATD PRESS: 5119

Card 2/2

AKSENOV, M. Ya.; VERNIDUB, I. I.; KARTSIVADZE, A. I.; OKUDZHAVA, A. M.; PLAUDE, N. O.; SHISHMINTSEV, V. V.

Study of the ice-forming activity of silver iodide aerosol generated in the burning process of pyrotechnical compositions. Trudy Inst. geofiz. AN Gruz. SSR 20:197-204 '62. (MIRA 16:1)

(Silver iodide) (Atmospheric nucleation)

ZAIEVSKIY, N.I.; KULIKOVA, A.N.; KUL'VINOVA, L.A.; SHISHMAREVA, O.Ya.; YAKOVLEVA, M.V.

Porous structure and physicochemical properties of natural sorbents of some deposits of Far East. Trudy DVFAN SSSR. Ser.khim. no.7:26-30 '65. (MIRA 18:12)

42069

S/589/62/000/061/002/005
A061/A126

AUTHORS: Shishmolin, A.N., Solov'yev, V.I.

TITLE: A correlation method for fluctuation-noise suppression in measuring crystal microphones

SOURCE: USSR. Komitet standartov, mer i izmeritel'nykh priborov. Trudy institutov Komiteta. No. 61 (121). 1962. Issledovaniya v oblasti akusticheskikh i gidroakusticheskikh izmereniy. 42 - 44

TEXT: A so-called synchrophone is described in which the fluctuation noise at the output of the measuring microphone is suppressed by the parallel connection of two similar amplifiers to a sensitive element consisting of two piezoelectric crystals. The two crystals are separated by a grounded plate, and the amplified crystal signals are fed to a synchronous detector. The presence of two synchronous electrical oscillations permits the use of a simple correlation method for suppressing the fluctuation noise. By this method a reference voltage being synchronous with the signal (synchrophone principle) is obtained, so that highly stable piezoelectric elements can be used as pickups at low sound

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A correlation method for fluctuation-noise....

pressures. An important requirement of the system is the linearity of transformation, but not so important is the degree of similarity of the piezoelectric elements and the amplifiers. A calculation shows that the fluctuation noise level at the pickup output can be lowered to 30 - 35 db. There is 1 figure.

SUBMITTED: September, 1959

ALIMOCHKIN, V.K.; IVASHCHENKO, T.F.; LYUBAVIN, Yu.P.; OVCHINNIKOV, A.K.; SHISHMOLIN, A.N.

Multiparameter, simultaneously recording, logging apparatus MAK for complex geophysical studies of holes in ore deposits. Vop.rud.geofiz. no.3:119-146 '61. (MIRA 15:8)
(Logging (Geology)--Equipment and supplies)

SINEV, N.M.; BATUROV, B.B.; SHELOV, V.M. [Shmelev, V.M.]

The ways of nuclear power development in the Soviet Union.
Jaderna energie 10 no.12:427-434 D '64.

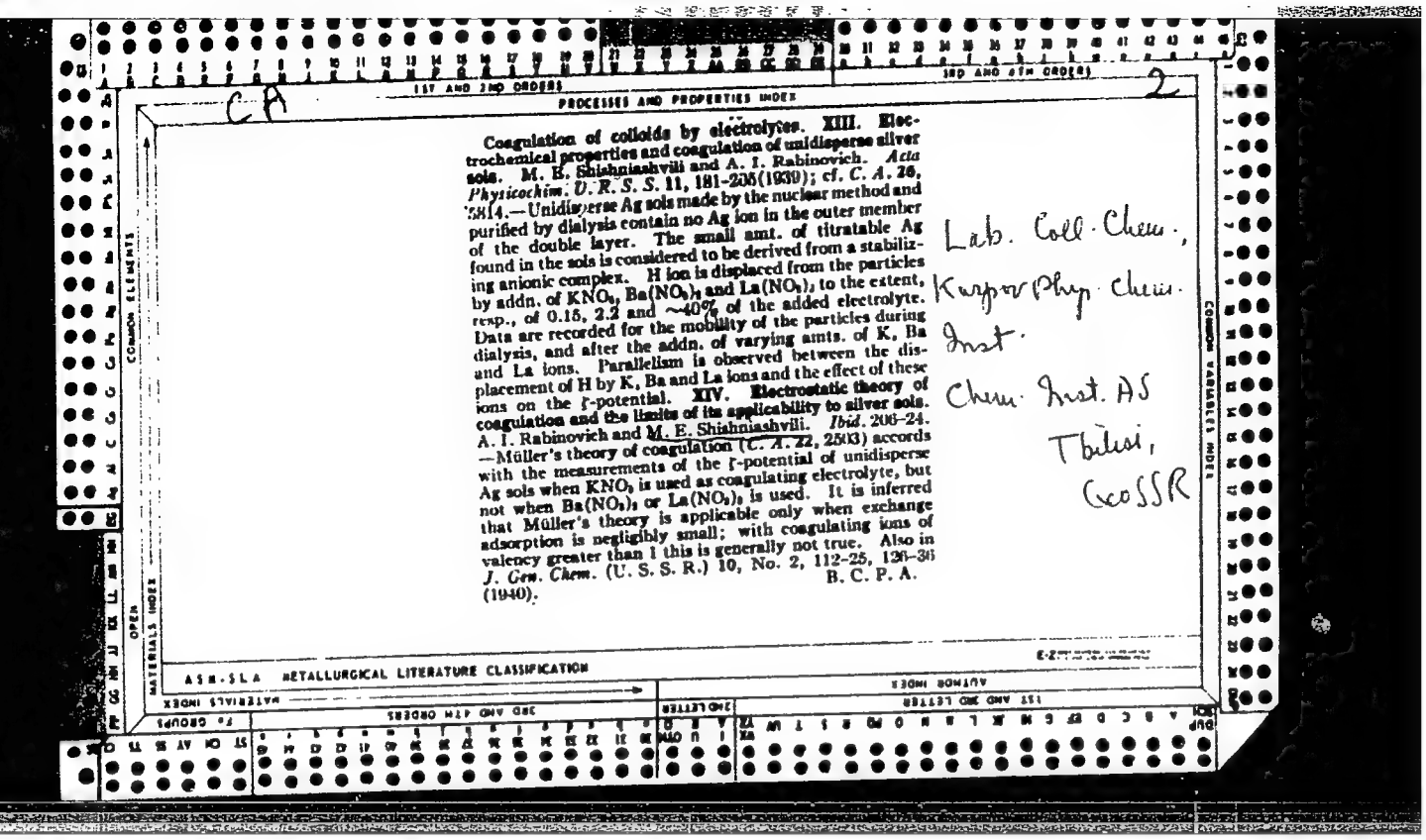
KHRIPUNOV, I.A.; SHMERMAN, Kh.B., nauchnyy sotrudnik; OL'KHOVOY, A.I., nauchnyy sotrudnik

Automatic information treatment. Avtom. telem. i sviaz' 8 no.9:9-12 S '64. (MIRA 17:10)

1. Starshiy inzh. Ural'skogo otdeleniya Vsesoyuznogo nauchno-issledovatel'skogo instituta zheleznodorozhnogo transporta Ministerstva putey soobshcheniya (for Khripunov).

SHMIDT, V.V.

Behavior of [illegible] in a decreasing magnetic field.
Usp.fiz.nauk. 82 no.1:189-191 S '64. (MIRA 17:10)



CA

2

PROCESSES AND PROPERTIES INDEX

Coagulation of colloids by electrolytes. XIII. Electrochemical properties and coagulation of unidisperse silver sols. M. E. Shishniashvili and A. I. Rabinovich. *Acta Physicochim. U. R. S. S.* 11, 181-206(1939); cf. *C. A.* 26, 5814.—Unidisperse Ag sols made by the nuclear method and purified by dialysis contain no Ag ion in the outer member of the double layer. The small amt. of titratable Ag found in the sols is considered to be derived from a stabilizing anionic complex. H ion is displaced from the particles by addn. of KNO_3, $Ba(NO_3)_2$ and $La(NO_3)_3$ to the extent, resp., of 0.15, 2.2 and ~40% of the added electrolyte. Data are recorded for the mobility of the particles during dialysis, and after the addn. of varying amts. of K, Ba and La ions. Parallelism is observed between the displacement of H by K, Ba and La ions and the effect of these ions on the ζ-potential. XIV. Electrostatic theory of coagulation and the limits of its applicability to silver sols. A. I. Rabinovich and M. E. Shishniashvili. *Ibid.* 206-24.—Müller's theory of coagulation (*C. A.* 22, 2503) accords with the measurements of the ζ-potential of unidisperse Ag sols when KNO_3 is used as coagulating electrolyte, but not when $Ba(NO_3)_2$ or $La(NO_3)_3$ is used. It is inferred that Müller's theory is applicable only when exchange adsorption is negligibly small; with coagulating ions of valency greater than 1 this is generally not true. Also in *J. Gen. Chem.* (U. S. S. R.) 10, No. 2, 112-25, 126-36 (1940). B. C. P. A.

Lab. Coll. Chem.,
Karpov Phys. Chem.
Inst.
Chem. Inst. AS
Tbilisi,
GeoSSR

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

SHISHNIASHVILI, A. Ye.; RABINOVICH, A.I.

"The Coagulation of Colloids by Means of Electrolytes." Part XIII. "The Electrochemical Properties and the Coagulation of Monodispersed Silver Sols" Zhur. Obshch. Khim., 10, No. 2, 1940. Chemical Institute of the Georgian Affiliate of the Academy of Sciences USSR, and the Physico-Chemical Institute imeni L. Ya. Karpov.
Received 27 June 1939

[redacted] Report U-1526, 24 Oct 51.

A. C. S.

Geology

Highly purified aluminum silicate salts. M. E. Shishniashvili and V. A. Kargin. *Zhur. Fiz. Khim.*, 15, 1121–28 (1941); *Chem. Abs.*, 36, 6063 (1942).—A very pure $Al_2O_3 \cdot 4SiO_2$ was prepared and further purified by prolonged dialysis and electrodialysis, first at 40 to 50 v./cm. (400 hr.) and finally at 800 v./cm. (50 hr.). The final sols obtained contained 1.9×10^{16} particles of 30 mμ diameter per liter; the specific electrical conductivity was 1.3×10^{-6} mho. The particles do not migrate in an electrical field. These results indicate that the charge of soil particles is not due to silicates of aluminum.

PA 52T4

SHISHNIASHVILI, M.

USSR/Chemistry - Silicic acid, Gelation of Jul/Aug 1946
Chemistry - Electrochemistry

"The Electrochemical Properties of Highly Purified Ferrialuminosilica Gels and Sols," M. Shishniashvili, Chem Inst, Acad Sci Georgian SSR, Tibilisi; V. Kargin, Karpov Inst Phys Chem, Moscow, 18 pp

"Acta Physicochimica URSS" Vol XXI, No 4

Study of highly purified mixed gels of silicic acid and sesquioxides. There are no electric charges on gel particles, indicating that gels contain no ionizable groups. Concludes that pure aluminosilica gels are not electrolytes. Received 4 May 1945.

52T4

SHISHNYAVILI, M.

PA 54T41

USSR/Chemistry - Electrolytes, Effect on Sep/Oct 1946
Chemistry - Ferrialuminosilica Gels

"The Action of Electrolytes on Highly-Purified Ferrialuminosilica Gels," M. Shishnyavili, V. Kargin, A. Barzanadze, Chem Inst, Acad Sci Georgian SSR, Tbilisi, 16 pp

"Acta Physicochimica URSS" Vol XXI, No 5

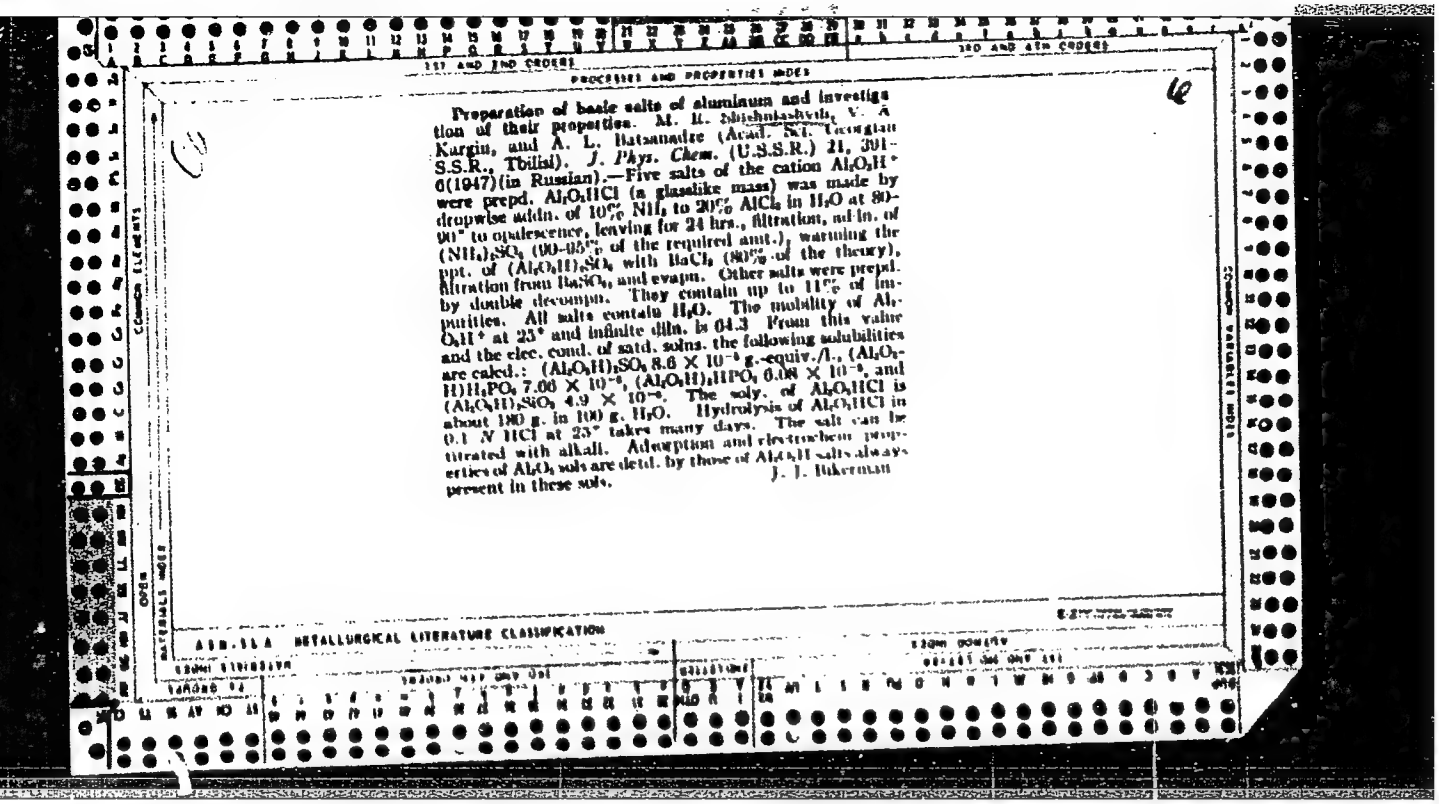
Pure gels are not electrolytes and lack all aptitude to exchange adsorption. When acted upon by neutral salts, hydrolytic adsorption takes place attended by chemical interaction of adsorbed acids with aluminosilica gels. Compounds formed in this process are poorly soluble electrolytes, appearance of which

[redacted] 54T41

USSR/Chemistry - Electrolytes, Effect on (Contd) Sep/Oct 1946

results in initiation of exchange-adsorption properties of gels. Received, 4 May 1945.

[redacted] 54T41



Preparation of basic salts of aluminum and investigation of their properties. M. E. Shishniashvili, V. A. Kargin, and A. L. Ratsanadze (Acad. Sci. Georgian S.S.R., Tbilisi). *J. Phys. Chem.* (U.S.S.R.) 21, 391–6(1947)(in Russian).—Five salts of the cation $Al_2O_3H^+$ were prepd. Al_2O_3HCl (a glasslike mass) was made by dropwise addn. of 10% NH_4 to 20% $AlCl_3$ in H_2O at 80–90° to opalescence, leaving for 24 hrs., filtration, addn. of $(NH_4)_2SO_4$ (90–95% of the required amt.), warming the ppt. of $(Al_2O_3H)_2SO_4$ with $BaCl_2$ (80% of the theory), filtration from $BaSO_4$, and evapn. Other salts were prepd. by double decompn. They contain up to 11% of impurities. All salts contain H_2O. The mobility of $Al_2O_3H^+$ at 25° and infinite dilu. is 64.3. From this value and the elec. cond. of satd. solns. the following solubilities are calcd.: $(Al_2O_3H)_2SO_4$ 8.6×10^{-4} g.-equiv./l., $(Al_2O_3H)H_2PO_4$ 7.06×10^{-4}, $(Al_2O_3H)_2HPO_4$ 0.08×10^{-4}, and $(Al_2O_3H)_2SiO_3$ 4.9×10^{-4}. The soly. of Al_2O_3HCl is about 180 g. in 100 g. H_2O. Hydrolysis of Al_2O_3HCl in 0.1 *N* HCl at 25° takes many days. The salt can be titrated with alkali. Adsorption and electrochem. properties of Al_2O_3 sols are detd. by those of Al_2O_3H salts always present in these sols.

J. J. Bikerman

CA

Adsorption of electrolytes on aluminosilicic gels and new basic salts of aluminum. M. E. Shishniashvili (Acad. Sci. Tiflis, Georgia, U.S.S.R.). *Trudy Inst. Khim. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1950, 169–77.—Contrary to the view represented mainly by Mattson, aluminosilicic systems are not electrolytes with ionizable acid and basic groups of their own. Gels were prepd. by mixing 0.1 *N* solns. of $Al(NO_3)_3$ or $AlCl_3$ and Na_2SiO_3, and prolonged electrodialysis. In this process, the chem. compn. of the gel changed progressively; thus, an initial gel $Al_2O_3.2.4$ SiO_2 lead, at the end of the electrodialysis, the compn $Al_2O_3.1.65$ SiO_2. At the same time, the amt. of exchangeable Al decreases constantly, with the result that a highly dialyzed gel contains no exchangeable Al. The acidity which does appear in such highly purified gels under the action of salts, is due to hydrolytic splitting of the adsorbed salt. Fresh high-purity sols are uncharged, and cataphoretic mobility appears only after 40–50 min., evidently owing to slow transfer of ions from the liquid. Mobility appears immediately on addn. of even the smallest amt. of electrolyte; it clearly is not due to silicate or aluminosilicate ions. The isoelec. point in acid-base titration lies in the pH range 6.5–7.2, and its position is independent of the $Al_2O_3:SiO_2$ ratio of the gel, all titration curves intersecting at one point. On adsorption of PO_4^{---} ions (from a KH_2PO_4 soln.) at pH ranging from 7.85 to 3.00, the $Al_2O_3:SiO_2$ ratio in the ppt remains practically unchanged, but the PO_4 content increases regularly from 0.11 PO_4 to 2.4 PO_4 per Al_2O_3 2.2 SiO_2. This indicates a chem. reaction between KH_2PO_4 and the Al_2O_3 of the gel, resulting in the formation of basic Al phosphate. Anal. and potentiometric titration curves of ultrafiltrates of suspensions of Al_2O_3, SiO_2, PO_4 ppts., treated with KCl, show 2 breaks, one at pH 5.5 corresponding to Al^{+++}, the other at pH 7.5–8.0 due to basic cations $(Al_2O_3H)^{+}$ aq. Phosphate-treated gels possess a marked adsorption capacity for Ba^{++} even at pH 6 where the untreated pure gel does not adsorb.

N. Thon

SHISHNIASHVILI, M.Ye.; KARGIN, V.A.

Silication and liming of red soils. Trudy Inst. khim. AN Gruz.SSR 11:51-60 '53. (MIRA 10:2)

(Soils, Red) (Fertilizers and manures) (Lime)

SHISHNIASHVILI, M.E.

4

Aluminum oxide from terra rossa. S. N. Papuashvili, M. E. Shishniashvili, and M. V. Pirtskhalava. *Trudy Inst. Khim., Akad. Nauk Gruzin. S.S.R.* 11, 61–70(1953)(in Georgian; Russian summary); *Referat. Zhur., Khim.* 1954, No. 40952.—The 2-stage extn. of Al_2O_3 burnt red earth of Western Georgia was studied. The earth was treated with either H_2SO_4 or HCl. The salts of Al and Fe obtained in the 1st stage were sepd. by adding untreated red earth and removing from soln. the major part of Fe salts by means of hydrolysis followed by coagulation of Fe hydroxides. The weak acid formed in the hydrolysis process extd. Al salts with only a small admixt. of Fe salts. The HCl process yielded purer Al salts than did the H_2SO_4 process. For final purification of Al salts they were crystd. from soln. as Al NH_4 alums which were subsequently converted into pure Al_2O_3 and $(NH_4)SO_4$. In the first stage of extn. of sesquioxides from red earth a highly dispersible amorphous SiO_2 was obtained.

M. Hosch

CH

SHISHNIASHVILI, M.

3

Investigation of turf from Poti deposits in order to prepare alkali turf reagents. I. Tavberidze, M. Shishniashvili, and I. Mikadze. *Trudy Inst. Khim. im. P. G. Melikishvili, Akad. Nauk Gruzin. S.S.R.* 11, 71-6(1953)(Russian summary).—The best method of leaching humic substances from turf is the treatment of turf with concd. NaOH. Paste so obtained after dilu. with H_2O contains a sufficient amt. of humus substances for treatment of argillaceous soils.

N. Charmandarian

SHISHNIASHVILI, M. Ye.; BASTANADZE, A.L.

Exchange aluminum in alumosilica gels. Kolloid. Zhur. 15, 130-5 '53. (MLRA 6:3)
(CA 47 no.16:7857 '53)

1. Acad. Sci. Georgian S.S.R., Tbilisi.

USSR/Colloid Chemistry. Dispersion Systems B-14

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26395

Author : S.N. Papuashvili, M.Ye. Shishniashvili, L.D. Agladze.
Inst : Academy of Sciences of Georgian SSR, Institute of Chemistry
Title : Nature of Acidity of Al-Bentonite and Influence of Exchangeable (Mobile) Aluminum on Its Colloidal-Chemical Properties

Orig Pub : Tr. In-ta khimii AN GruzSSR, 1956, 12, 23-35

Abstract : It is shown that the variety of bentonite - Al-Bentonite (I) is gradually saturated not with H^+ ions, but with Al^{3+} ions during the process of refining by electrodialysis and, consequently, instead of its H-variety, the Al-variety is formed contrarily to the usual idea. The formation of Al-bentonite is the result of partial destruction during the electrodialysis process in colloidal minerals, at which the amount of exchangeable Al^{3+} rises sharply with the decrease of pH of the suspension to a certain limit. It is shown that at the potentiometric titration, the amount of alkali absorbed by I is proportional to the amount of exchangeable Al^{3+}, if the chemical interaction of the alkali with the alumosilicate

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Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26395

nucleus of I was insignificant. The influence of the content of exchangeable Al^{3+} on some colloidal-chemical properties of electrodialysed suspensions of I (structural viscosity, dynamic shearing stress, stability and water yield) was also studied quantitatively. The hydrophilic nature and the electro-kinetic potential of colloidal I particles decrease with the increase of the exchangeable Al^{3+}.

USSR/Chemistry of Colloids - Dispersed Systems. B-14

SHISHNIASHVILI, M.Ye.

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18784

Author : I.L. Batsanadze, M.Ye. Shishniashvili, A.L. Batsanadze.
Inst : Institute of Chemistry of Academy of Sciences of Georgia SSR.

Title : Study of Structural-Mechanical and Physical-Chemical Properties of 'skan* Gel Suspensions Treated with High Pressures and High Temperature.

Orig Pub : Tr. In-ta khimii AN GruzSSR, 1956, 12, 37-48

Abstract : The changes of viscosity (n), water yield, specific electrical conductivity (k) and pH of highly dispersed Askan* gel suspensions (SA) after their preliminary treatment with high pressure (1 to 200 atm) and temperatures t from 20 to 200° were studied. It was shown that the temperature dependence of n has a maximum. SA_s are stable within the temperature interval between 80 and 100°; below this interval, mainly gelatination takes

Card 1/2 - 340 -

PAPUASHVILI, S.N.; SHISHNIASHVILI, M.Ye.; AGLADZE, L.D.

Influence of mobile aluminum and silicon on the structural cohesion and shearing stress of clay suspensions [in Georgian with summary in Russian]. Trudy Inst. khim. AN Gruz. SSR 13:3-16 '57. (MIRA 11:4)
(Aluminum) (Silicon) (Clay)

SHISHNIASHVILI, M.Ye.; BATSANADZE, A.L.

Decomposition kinetics of aluminum oxychloride [in Georgian with summary in Russian]. Trudy Inst. khim. AN Gruz. SSR 13:61-66 '57.
(Chemical reaction, Rate of) (Aluminum chloride)

USSR/Soil Science. Mineral Fertilizers U-5

Abs Jour : Ref Zhur - Biol., No 10, 1958, No 91459

Author : ~~Shishniashvili~~, Gorishvili, Prokof'yeva
Inst : Institute of Chemistry, AS Georgian SSR
Title : A Comparison of the Effectiveness of Limestone and Blast-Furnace Slags on Red Earth Soil

Orig Pub : Tr. In-ta khimii AN GruzSSR, 1957, 13, 67-76

Abstract : The results of laboratory experiments and vegetative tests on red soil, carried out in the Institute of Chemistry of the Academy of Science, Georgian SSR, showed that additions of silicate (blast-furnace slags etc) contain less CaO in balanced solutions than $CaCO_3$. It has been also found that they can be applied to the soil in higher doses than $CaCO_3$. -- N.N. Sokolov

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51

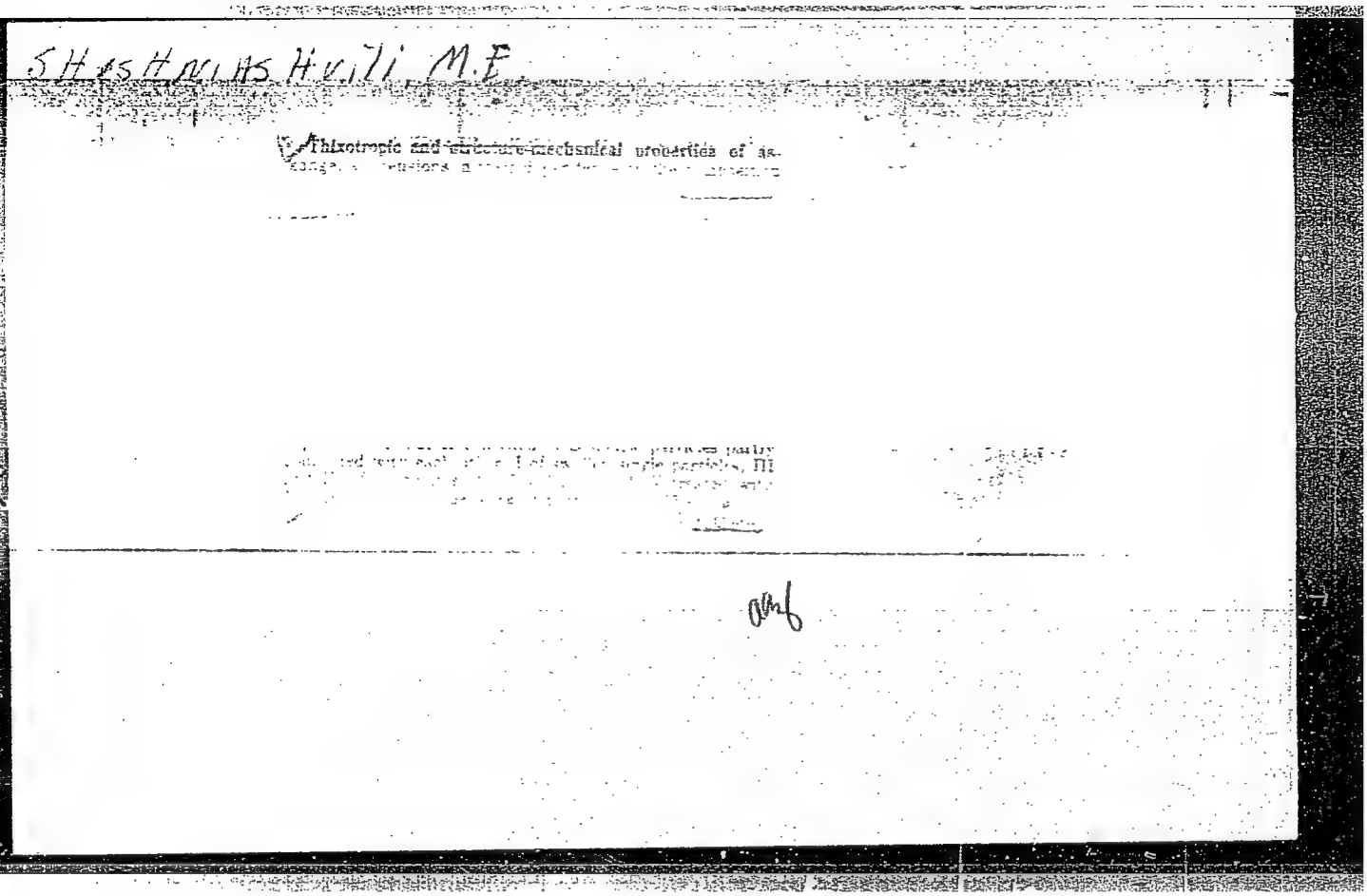
MIKADZE, I.I.; SHISHNIASHVILI, M.Ye.

Temperature influence on structural and mechanical properties of clay suspensions [in Georgian with summary in Russian]. Trudy Inst. khim. AN Gruz. SSR 13:77-83 '57. (MIRA 11:4)
(Clay)

KOBAKHIDZE, Ye.I.; SHISHNIASHVILI, M.Ye.

Thixotropic structure formation and the elasto-plasto-viscous properties of ascangel suspensions. Koll. zhur. 19 no.1:59-67 Ja-F '57. (MLRA 10:4)

1. Institut khimii Akademii nauk Gruz. SSR im. P.N. Melikishvili, Laboratoriya kolloidnoy khimii, Tbilisi.
(Bentonite) (Thixotropy)



SHASHKINA, Ye. I., M.E.

Thixotropic and structure-mechanical properties of as-

SHISHNIASHVILI, M.E.

4E2c

Action of a basic salt (aluminum oxychloride) on the structure mechanical [illegible]

[illegible] further aging. When [illegible] was [illegible] Askangel particles were isometric in an electron microscope and had diffuse outlines; on addn. of 0.005% I, chains appeared, and in the presence of [illegible] I coagulation was visible. I would improve askangel when used in drilling for petroleum.

J. J. Bikerman

UZNADZE, E.D.; SHISHNIASHVILI, M.Ye.

Preparation of the basic salt, alumimum hydroxychloride, from aluminum hydroxide. Trudy Inst.khim. AN Gruz.SSR 14:53-61 '58. (MIRA 13:4)

(Alumimum chloride)

UZNADZE, E.D.; SHISHNIASHVILI, M.Ye.

Effect of aluminum hydroxychloride on thixotropic structure formation in askangel suspensions. Trudy Inst.khim.AN Gruz.SSR 14:63-71 '58. (MIRA 13:4)
(Aluminum chloride) (Askangel)

PAPUASHVILI, S.N.; SHISHNIASHVILI, M.Ye.; AGLADZE, L.D.

Effect of electrolytes on the structural and mechanical properties of an askangel suspension. Trudy Inst.khim. AN Gruz.SSR 14: 73-82 '58. (MIRA 13:4)
(Askangel)

UZNADZE, E.D.; MUMLADZE, A.N.; SHISHNIASHVILI, M.Ya.

Electron microscopic investigation of structure formation in askangel suspensions. Soob. AN Gruz. SSR 20 no. 4:419-422 Ap '58. (MIRA 11:7)

1. Institut khimii im. P.G. Melikishvili AN GruzSSR. Predstavleno chlenom-korrespondentom akademii G.V. TStsishvili.
(Askangel) (Thixotropy)

SHISHNIASHVILI, M. Ye.; VOLAROVICH, M. P.; SERB-SERBINA, N. N.; DENISOV, N. Ya.; BERESTNEVA, Z. Ya.; KORZHUYEV, A. S.; NICHIPORENKO, S. P.; KUKOLEVA, G. V.; OVCHARENKO, F. D.; ANTIPOV-KARATAYEV, I. N.;

" Structure formation in the colloidal chemistry of clays and peat."

report presented at the Fourth All-Union Conference on Colloidal Chemistry, Tbilisi, Georgian SSR, 12-16 May 1958 (Koll zhur, 20,5, p.677-9, '58, Taubman, A.B)

AUTHORS: Avsarkisova, A. I., and Shishniashvili, M. Ye. 20-3-35/59

TITLE: Concentrated Ascangel (Obogashchennyy askangel').

PERIODICAL: Doklady AN SSSR, 1958, Vol. 118, Nr 3, pp. 540-542 (USSR)

ABSTRACT: Ascangel is one of the most characteristic representatives of true bentonites in the USSR (Askani Mine, Makharadze District, Georgian SSR). Its highly disperse fraction is a typical alkaline montmorillonite. Because of its properties this mineral plays an important rôle in the technique of trial borings. The isolation of colloidal fractions of ascangel is of great importance also for the following industries: foundry-, soap-, rubber-, paper-, cramic-, varnish- and color-, building material-, weaving-, perfume-, pharmaceutical, and many other industries (ref. 6,8). The coarsly disperse fractions of ascangel (contents approximately 30%) exert a negative influence on the colloidal properties of suspension. It sediments in the case of small concentrations (3,5 - 4 %). With increasing concentration (5 - 8 %) the mechanical resistance of the system increases only slowly and the tixotropic properties decrease. The influence of stabilizing and peptizing reagents on coarsly

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and highly disperse fractions shows very different results. Therefore the properties of the suspensions with coarsly disperse fractions can be regulated only with difficulties. Thus, the problem of a suited raw material for colloidal bore suspensions is solved by the isolation of highly disperse fractions of ascangel. The present methods are in-sufficient Since the chlorine salts of 2- and 3-valent cations are the most aggressive electrolytes (ref. 9) there is possibility of separating suspension phases of ascangel with small concentration of the electrolyte by means of the usual industrial centrifuges (up to 3000 rev/min) in a productive way. $BaCl_2$-solution was used as precipitator. After the separation of the dispersion medium a paste of the highly disperse fractions was formed. The paste was peptized with NA_2SO_4 in order to restors its colloidal properties. The obtained product, analogous to the American Akvazhel was called "enriched ascangel". Separation of the coarsly disperse fractions (31 %) from a diluted ascangel-suspension was achieved by a vertical centrifuge. In order to avoid the formation of barium carbonate the suspension was first acidified with HCl to pH 6. The peptized paste had a pH = 6,8.

Concentrated Ascangel 20-3-35/59

Water suspensions of enriched ascangel show highly tixotropic properties which they retain within a wider range of concentration than the formerly used ascangel preparation "Askankoll" (fig. 2). The suspensions of the new preparations are durable and can be used in the above industries as active interstitial, binding, adhering, and suspending material, plastificator, fat substitute, etc. There are 2 figures, 1 table, and 11 references, all of which are Slavic.

ASSOCIATION: Institute for Chemistry, AN Georgian SSR (Institut khimii Akademii nauk GruzSSR).

PRESENTED: July 10, 1957, by V. A. Kargin, Academician

SUBMITTED: July 6, 1957

AVAILABLE: Library of Congress

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SH-TS-HPITTS Hvili, M. Ye.

15(6)

AUTHOR: Rebinder, P. A., Academician SOV/30-59-1-5/57

TITLE: New Trends of Colloid Chemistry (Novyye puti razvitiya kolloidnoy khimii)

PERIODICAL: Vestnik Akademii nauk SSSR, 1959, Nr 1, pp 44-51 (USSR)

ABSTRACT: At present, colloid chemistry plays an especially important part in political economy as it is a physical-chemical science concerning substances of modern engineering. It is of great practical importance that at present it is possible to carry on uninterrupted transitions from lyophobic to lyophilic systems. Thus, it is possible to obtain technically important substances with the required structural-mechanical properties. The theory of highly molecular substances and their solutions has developed into an independent branch of colloid chemistry. The vitality of modern colloid chemistry is proved by the fact that it produces many new independent branches of science. Further, the author describes the course of the 4th All-Union Conference of Colloid Chemistry which took place in Tbilisi on May 13-16, 1958. It was organised by the Otdeleniye khimiches-

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N. N. Natanson (Kiyev) reported on the present state of research in the field of colloid metals.
A. D. Sheludko (Bulgaria) determined theoretically and experimentally the regularities of synaeresis in foams.
M. P. Vollarovich with collaborators spoke about the results of examination of water properties and structure of peat by means of radioactive isotopes.
M. Ye. Shishniashvili considered questions of adsorption and ~~chemosorption of electro~~lytes in colloid dispersion systems.
B. V. Deryagin and his collaborators reported on the development of the electrostatic stability theory as well as the coagulation of dispersion systems, and on the theory of formation and the properties of aerosols.
L. Ya. Kremnev, A. B. Taubman reported on the role of the structural-mechanical barrier as a factor of practical guarantee for a full stabilisation of dispersion systems, as P. A. Rebinder showed it in his investigations (Ref 1).
V. G. Levich theoretically showed that an increased viscosity of the protective coverings of the stabiliser is sufficient to prevent a coagulation of particles.
M. M. Dubinin and his pupils dedicated a series of reports to examinations in the field of structural characteristics.
A. N. Frumkin with collaborators examined new appearances of adsorption in the theory of electrode processes.
B. A. Dogadkin, A. Ya. Korolev discussed questions of adsorptive interaction of active fillers with polymers, as well as of the chemical modification of the surfaces of solid particles (soot).

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Ye. Ye. Segalova, P. A. Rebinder and collaborators reported on the clarification of the process of formation of crystallisation structure in the hardening of mineral binding agents.
G. M. Bartenev showed that the appearance of high elasticity is connected with the formation of dispersion structure.
L. S. Palatnik (Khar'kov) examined the colloidal state of aging alloys in thin films and massive samples.
Ye. D. Shchukin, V. V. Yudina clarified the theoretical criteria of spontaneous dispersion of solid bodies, especially metals, in surface-active surroundings.
V. I. Likhtman reported on the appearance of adsorptive plastification of lead and tin at normal temperatures.
L. A. Kozarovitskiy and collaborators examined the influence of rheological properties of printing colors on their behavior in the printing process.
I. N. Vlodavets reported on the regulation of crystallisation and coagulation structures in the production of best table-butter.

SHISHNIASHVILI, M.Ye.; KOBAKHIDZE, Ye.I.

Structure formation in askangel suspensions. Trudy Inst.khim.AN Azerb.SSR 17:60-71 '59. (MIRA 13:4)

1. Institut khimii AN GruzSSR.
(Askangel)

5(4) SOV/69-21-3-23/25

AUTHORS: Shishniashvili, M.Ye. and Avsarkisova, A.I.

TITLE: Obtaining and Investigating the Thixotropic Qualities of a Suspension of Highly Dispersed Ascangel Particles

PERIODICAL: Kolloidnyy zhurnal, 1959, Vol XXI, Nr 3, pp 364-369 (USSR)

ABSTRACT: The authors report on a number of experiments intended to isolate a highly disperse phase of finely fractured (particles $\leq 1\mu$) ascangel (bentonite) with the aid of a weak concentration of an electrolyte and to restore the colloidal properties of the substance by reverse peptization. For their experiments the authors used highly efficient industrial centrifuges (2,000-3,000 rpm), with the aid of which the preliminary sedimentation of coarse particles ($>1\mu$) was also carried out. As electrolyte the authors used $BaCl_2$. Due to its higher absorption energy, Ba^{2+} substituted Na^+,

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which had been adsorbed on the ascangel particles. The suspension lost its stability and syneresis could be observed. After separation of the dispersing medium from the substance, a paste of highly dispersed ascangel particles was obtained. This intermediate product was called by the authors "coagulation paste". In order to restore the colloidal properties of the substance, the paste was peptized with Na_2SO_4, as a result of which Na^+ substituted Ba^{2+}. Due to the formation of the sparingly-soluble $BaSO_4$ the exchange reaction, practically, continued to the end. The obtained product, which is similar to the American aquagel, was called "enriched ascangel". The results of the investigation can be summarized as follows. It is possible to isolate highly dispersed ascangel particles with the aid of small quantities of $BaCl_2$ (25 mg-equ/100 g, or 2.5% of the

Obtaining and Investigating the Thixotropic Qualities of a Suspension of Highly Dispersed Ascangel Particles

weight of ascangel). The separation of the phases of such a suspension is possible in a centrifuge (1,500 - 3,000 rmp) or by means of vacuum filtration. Coarse ascangel particles, which constitute about 30% ascangel in the natural state, can be separated from a dilute suspension (~2.5%) in a vertical sedimenting centrifuge (1.620 rpm) of high capacity. Colloidal properties can be restored to the paste by the use of Na_2SO_4 in stoichiometric proportion to the initially added $BaCl_2$. The obtained colloidal product represents a highly disperse fracture of true alkaline bentonite (ascangel). Suspensions of "enriched ascangel" are characterized by considerable fluidity and thixotropy. It can be used therefore, for the preparation of highly disperse drilling suspensions and for other purposes. The authors mention

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Obtaining and Investigating the Thixotropic Qualities of a Suspension of Highly Dispersed Ascangel Particles

the Soviet scientists I.N. Antipov-Karatayev, K.K. Gedroits, S.Ya. Veyler and P.A. Rebinder. There are 3 graphs, 5 tables and 17 Soviet references.

ASSOCIATION: Institut khimii AN Gruz. SSR - Laboratoriya kolloidnoy khimii, Tbilisi (Institute of Chemistry of the AS Gruzinskaya SSR - Laboratory of Colloid Chemistry, Tbilisi)

SUBMITTED: 9 October, 1957

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17(4)
AUTHOR: Shishniashvili, M. Ye. SOV/20-126-2-54/64

TITLE: New Kinds of Organic-mineral Microfertilizers and Their Application Possibilities (Novyye vidy organo-mineral'nykh mikroudobreniy i vozmozhnosti ikh primeneniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 2, pp 421-423 (USSR)

ABSTRACT: The arrangement of the electrolytes between the soil and the plant determines the assimilability of the elements serving as nutritive substances. This is one of the processes originating in the soil, which are connected with its absorption capacity. In many cases the equilibrium concentrations of the necessary substances are rather slight. This especially concerns the oxides of polyvalent elements in carbonate, alkaline and other soils. In these cases the adsorptive distribution of these and other elements can be thoroughly changed by introduction of organic substances which form organic-mineral complexes with polyvalent elements. Such complexes can be formed by oxidative destruction of polymeric hydrocarbons (various waste of vegetable raw

products). They are excellent substances for the formation of new kinds of microfertilizers mentioned in the title in easily accessible and assimilable form (Ref 1). Thus elements necessary for the plants can be introduced as non-ionizable complexes. They are absorbed by the soil to an incomparable weaker extent than the ions of the same metals. Further they are able to stand the conditions with sufficiently high pH-values. Chemically similar compounds were used mainly in foreign countries - so-called chelates (Ref 2). They differ, however, considerably by their influence on the plants. Figure 1 shows the diagrams of potentiometric titration of organic iron compounds, called OP-V-Fe and OP-M-Fe by the authors, beside a diagram of $FeCl_2$ and $FeCl_3$-solutions with a 2 n-solution of NaOH. The first mentioned microfertilizers are not precipitated by this titration, but change their coloring and turn into colloidal solutions. This is their specific characteristic. Further investigations lead to the production of preparations of higher value. In collaboration with M. V. Pirtskhalava the

author developed 13 kinds of microfertilizers (Ref 1). Apart from polyvalent metals they contain carbohydrates with different molecular weight and optical activity, a composition of salts of organic acids, decomposition products of vegetable proteins et al. Some of them apparently play the part of biogenic stimulants. Experiments with these preparations indicated a large range of application under working conditions: fighting vine chlorosis, in which case Fe- and Mn-compounds proved the most successful. The resistance of the plants against the factors of surroundings such as temperature, soil acidity, soil salt content et al is increased. Many colloidal systems (Ref 3) and apparently also fermentative colloidal systems are stabilized thereby. Consumption amounts to several dozen grams (seed saucing) up to several kilograms (spraying). As an illustration experimental results obtained in the Sovkhoz Khirsa are indicated. T. G. Mazanashvili (Institut vinogradarstva i vinodeliya = Institute for Vine-culture and Wine-making) has achieved a constant renovation of the physiological functions of vine affected with chlorosis by sprayings in

collaboration with the chief agronomist of the Sovkhoz , V. I. Avsadzhanishvili. By saucing the tobacco seed under the direction of M. D. Bregvadze (Lagodekhskaya opytnaya stantsiya tabaka i makhorki = Lagodekhi Experimental Laboratory for Tobacco (Nicotiana tabacum) and Rural Tobacco (N. rustica)) and by fertilizing the leaves a more intensive development of the plants, a premature blooming and capsule ripeness was achieved. V. A. Kargin, Academician, gave valuable advice. There are 1 figure and 3 Soviet references.

ASSOCIATION: Institut khimii Akademii nauk GruzSSR (Institute for Chemistry of the Academy of Sciences of the Gruzinskaya SSR)

PRESENTED: December 25, 1958, by V. A. Kargin, Academician

SUBMITTED: December 18, 1958

68703
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D034/D003

5.4400

AUTHORS: Papuashvili, S.N., Shishniashvili, M.Ye.

TITLE: Surface-Chemical Phenomena and Structuration in Ascangel Suspensions

PERIODICAL: Kolloidnyy zhurnal, 1960, Vol XXII, Nr 1, pp 49-56 (USSR)

ABSTRACT: The present paper, which was delivered as a report during the IV Vsesoyuznaya konferentsiya po kolloidnoy khimii (4th All-Union Conference on Colloidal Chemistry) in Tbilisi (1958), offers the results of a study of the effect of different electrolytes on thixotropic structuration in suspensions of ascangel from the Tsikhis-Ubani deposit in the Gruzinskaya SSR. The authors investigated the structural-mechanical properties of suspensions in dependence on adsorptive, electrokinetic and other surface-chemical changes

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Surface-Chemical Phenomena and Structuration in Ascangel Suspensions

occurring during the interaction of ascangel with the electrolytes. The change of the structuro-mechanical properties of suspensions of electrodialysed or alkali-treated ascangel greatly depends on the change in character and content of easily soluble Al and Si compounds. Curve 1 in graph 1 shows that the quantity of exchangeable Al (basic and trivalent Al ions) formed during electrodialysis on the surface of the particles sharply increases with diminution of the pH value of the suspension. After prolonged interaction with growing quantities of NaOH the quantities of exchangeable Al and Si compounds in ascangel suspension are also on the increase. The content of dissolved silicates in alkali-treated suspensions increases by several times at a temperature increase from 25 to 130° C. The sharp break in the structuro-mechanical

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Surface-Chemical Phenomena and Structuration in Ascangel Suspensions

properties of the suspension with the change of the pH of the suspension coincides with the beginning of abundant formation of exchangeable Al and Si (graph 1). The effect of the electrolytes (Na_2SiO_3, $Na_4P_2O_7$, $(NaPO_3)_6$, $NaAlO_2$, NaOH, Na_2CO_3, etc.) on the structuration of electrodialyzed ascangel suspension was different. On interaction of the suspension with Na_2SiO_3, $(NaPO_3)_6$ and $Na_4P_2O_7$ the formation of thixotropically fully reversible structures could be observed. These structures formed as a result of intensive adsorption of multivalent anions, the increase of the quantity of easily soluble Si compounds on the surface of the particles and the high values of the ζ -potential. Electrolytes enriching the ascangel particle surface

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Surface-Chemical Phenomena and Structuration in Ascangel Suspensions

with various truly soluble and sparingly soluble Al compounds or depriving it of the easily soluble Si compounds and of the anions of the potential determining layer favor the increase of non-thixotropic bonds between the suspension particles. NaOH and Na_2CO_3 occupy an intermediate position between these two kinds of differently acting electrolytes. In their introductory notes the authors mention A.V. Dumanskiy [Ref. 1], who with his collaborators ascertained that the formation of colloidal systems with thixotropic properties mostly depends on the lyophilic character of the disperse phase. P.A. Rebinder and his school [Ref. 2] maintain that thixotropic structuration in aqueous clay suspensions with anisodiametric particles is favored by the highly hydrophilic character of most of the particle surface. I.A. Uskov [Ref. 9] forwarded the opin-

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D034/D003

Surface-Chemical Phenomena and Structuration in Ascangel Suspensions

ion that the change in the structuro-mechanical properties of clay suspensions depends on the excess amount of introduced electrolyte. According to S. Mattson [Ref. 10] dispersity, hydrophilic character, plasticity and other properties of Al-Si colloids are prevalently connected with the chemical nature of the particle surface which changes on their interaction with the elctrolytes. There are 8 graphs and 25 references, 24 of which are Soviet and 1 German.

ASSOCIATION: Institut khimii AN GruzSSR, Laboratoriya kolloidnoy khimii, Tbilisi (Institute of Chemistry of the AS Gruzinskaya SSR, Laboratory of Colloidal Chemistry, Tbilisi)

SUBMITTED: July 4, 1958

Card 5/5.

PAPUASHVILI, S.N.; SHISHNIASHVILI, M.Ye.; KURIDZE, L.V.

Exchange acidity in colloidal systems of natural aluminosilicates.
Koll. zhur. 22 no.4:451-457 Jl-Ag '60. (MIRA 13:9)

1. Institut khimii AN SSSR, Laboratoriya kolloidnoy khimii, Tbilisi.
(Aluminosilicates) (Ion exchange)

SHISHNIASHVILI, M. Ye.

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PHASE I BOOK EXPLOITATION SOV/6195

Nauchnaya konferentsiya institutov khimii Akademiy nauk Azerbaydshanskoy, Armyanskoy i Gruzinskoy SSR. Yerevan, 1957.

Materialy nauchnoy konferentsii institutov khimii Akademiy nauk Azerbaydzhanskoy, Armyanskoy i Gruzinskoy SSR (Materials of the Scientific Conference of the Chemical Institutes of the Academies of Sciences of the Azerbaydzhan, Armenian, and Georgian SSR) Yerevan, Izd-vo AN Armyanskoy SSR, 1962. 396 p. 1100 copies printed.

Sponsoring Agency: Akademiya nauk Armyanskoy SSR. Institut organicheskoy khimii.

Resp. Ed.: L. Ye. Ter-Minasyan; Ed. of Publishing House: A. G. Sikuni; Tech. Ed.: G. S. Sarkisyan.

PURPOSE: This book is intended for chemists and chemical engineers, and may be useful to graduate students engaged in chemical research.

COVERAGE: The book contains the results of research in physical, inorganic, organic, and analytical chemistry, and in chemical engineering, presented at the Scientific Conference held in Yerevan, 20 through 23 November 1957. Three reports of particular interest are reviewed below. No personalities are mentioned. References accompany individual articles.

Card 3/11

2/2

KOBAKHIDZE, I.Ye.; SHISHNIASHVILI, M.Ye.

Imparting hydrophobic properties to askangel by organic compounds.
Trudy Inst.khim.AN Gruz.SSR 16:133-139 '62. (MIRA 16:4)
(Askangel)

SHISHNIASHVILI, M.Ye.; BATSANADZE, A.L.; MUMLADZE, A.N.

Highly concentrated colloid solutions. Part 1: Iron hydroxide sols. Trudy Inst.khim.AN Gruz.SSR 16:141-150 '62.
(MIRA 16:4)

(Iron hydroxides) (Colloids)

JUN 25 1963

PHASE I BOOK EXPLOITATION SOV/6195

Nauchnaya konferentsiya institutov khimii Akademiy nauk Azerbaydshanskoy, Armyanskoy i Gruzinskoy SSR. Yerevan, 1957.

Materialy nauchnoy konferentsii institutov khimii Akademiy nauk Azerbaydzhanskoy, Armyanskoy i Gruzinskoy SSR (Materials of the Scientific Conference of the Chemical Institutes of the Academies of Sciences of the Azerbaydzhan, Armenian, and Georgian SSR) Yerevan, Izd-vo AN Armyanskoy SSR, 1962. 396 p. 1100 copies printed.

Sponsoring Agency: Akademiya nauk Armyanskoy SSR. Institut organicheskoy khimii.

Resp. Ed.: L. Ye. Ter-Minasyan; Ed. of Publishing House: A. G. Sikuni; Tech. Ed.: G. S. Sarkisyan.

PURPOSE: This book is intended for chemists and chemical engineers, and may be useful to graduate students engaged in chemical research.

Card 1/11

COVERAGE: The book contains the results of research in physical, inorganic, organic, and analytical chemistry, and in chemical engineering, presented at the Scientific Conference held in Yerevan, 20 through 23 November 1957. Three reports of particular interest are reviewed below. No personalities are mentioned. References accompany individual articles.

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PHYSICAL CHEMISTRY

SHISHNIASHVILI, M.Ye.; PIRTSKHALAVA, M.V.; ODILAVADZE, L.N.

Complexons from natural compounds. Trudy Inst.khim.AN Gruz.SSR 16:111-116 '62. (MIRA 16:4)
(Complexons)

PAPUASHVILI, S.N.; BATSANADZE, A.L.; SHISHNIASHVILI, M.Ye.

Effect of organic acids on the adsorption properties of askangels.
Trudy Inst.khim.AN Gruz.SSR 16:117-126 '62. (MIRA 16:4)
(Askangel) (Acids, Organic) (Adsorption)

AVSARKISOVA, A.I.; SHISHNIASHVILI, M.Ye.

Study of the visco-elastic properties of concentrated askangel suspensions. Trudy Inst.khim.AN Gruz.SSR 16:151-158 '62.
(MIRA 16:4)

(Askangel) (Suspensions (Chemistry))

L 18590-65 EWT(m)/EPF(c)/EPA(w)-2/EWP(j)/EWP(b)/T/EWP(t) Pc-4/Pab-10/Pr-4
IJP(c) WH/JD/WW/RM
ACCESSION NR: AP4045406 S/0069/64/026/005/0625/0628

AUTHOR: Shishniashvili, M. Ye.; Batsanadze, A. L.; Odilavadze, L. N.

TITLE: Highly concentrated colloidal dispersions of polyvalent metal hydroxides

SOURCE: Kolloidny*y zhurnal, v. 26, no. 5, 1964, 625-628

TOPIC TAGS: polyvalent metal complex, colloidal dispersion, polyvalent metal colloid, colloid stabilization, colloid stabilizer, sol

ABSTRACT: Conditions for production of highly concentrated and stable colloidal solutions of polyvalent metal hydroxides were studied and a number of their colloid-chemical properties were investigated. Colloids were produced with di- and trivalent iron, manganese, aluminum, chromium, cobalt and copper. Sols were purified by ordinary dialysis in cellophane sacks to pH 7-9 and specific conductance of 10^{-3}-10^{-4} $ohm^{-1} \cdot cm^{-1}$. Only sols of trivalent iron were obtained even in the acid region. Sols were stabilized by the new type of stabilizers made from natural polymeric carbohydrates (wastes from plant materials) by oxidation and

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L 18590-65
ACCESSION NR: AP4045406

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thermal destruction. These stabilizers are complex mixtures consisting of the type of polyhydroxy carboxylic acids of low molecular weight, capable of producing water soluble and stable in alkaline medium complexes with polyvalent metals. These complexes are similar to metal-EDTA complexes, but are much more stable. These stabilizers enable production of ferric hydroxide colloids up to the concentration of 119 g/1. Further increase of the concentration of sols was done by evaporation at 50-60°C. Without exception all sols of polyvalent metal hydroxides were negatively charged, which is characterized by the nature of the stabilizer. All these sols are polydispersed and consist of spherical particles. Their particle size ranges from 10 to 460 m . Orig. art. has: 2 tables and 2 figures.

ASSOCIATION: Institut khimii AN GSSR im. P G Melikishvili (Chemistry Institute Academy of Sciences GSSR)
SUBMITTED: 12May63 ENCL: 00

SUB CODE: GC NO REF SOV: 002 OTHER: 002

Card 2/2

SHISHNIASHVILI, R.M.

New forms of the pine Pinus Sosnovskiy Nakay. Soob. AN Gruz. SSR 35 no.3:663-668 S '64. (MIRA 17:11)

1. Tbilisskiy institut lesa. Predstavlenc akademikom V.Z. Gulisashvili.

Shisho, G. A.

Utilization of sulfite-alcohol wash water and hardening accelerators in architectural concrete. G. A. Shisho. *Gidrotekh. Stroitel.* 23, No. 3, 24-6(1954).—Sulfite-alc. wash water, $CaCl_2$, and mixts. of these were added to architectural concrete for use in construction of Volga-Don Canal. Optimum results were obtained with 4% of wash water (25% soln. of 1.13 sp. gr.). Structural gypsum mixed with wash water was cream colored. B. Z. Kamich

SHISHO G.A.

MEDVEDEV, V.M., kandidat tekhnicheskikh nauk, laureat Stalinskoy premii; SHISHO, G.A., inzhener.

Executing concrete work in winter without heating the materials and concrete. Gidr.stroi 23 no.5:1-5 '54. (MLRA 7:8)
(Concrete construction--Cold weather conditions)

SHISHO, G.A., inzhener.

Calking the joints between slab envelopes. Gidr.stroi. 25 no.2: 19-21 '56. (MLRA 9:8)
(Canals) (Concrete construction)

KURINNYY, T.G., laureat Stalinskoy premii, inzhener; MEDVEDEV, V.M., laureat Stalinskoy premii, kandidat tekhnicheskikh nauk; SHISHO, G.A., laureat Stalinskoy premii, inzhener.

Investigation under natural conditions of "cold" concreting. Gidr. stroi.25 no.6:14-18 Jl '56. (MLRA 9:9)
(Volga-Don Canal) (Concrete construction--Cold weather conditions)

SHISHO, G.A., inzh.

Sealing joints between slab-shells of hydraulic structures.
Gidr.stroi. 26 no.10:26-28 O '57. (MIRA 10:10)
(Concrete construction)

NEKRASOV, V.V.; SHISHO, G.A.

Contraction of portland cement with chloride additives during hardening at, temperatures above and below freezing. Zhur. prikl. khim. 31 no.10:1460-1466 O '58. (MIRA 12:1)

1.Kafedra khimii Plodoovoshchnogo instituta imeni I.V. Michurina i nauchno-issledovatel'skiy sektor Gidroproyekta imeni S.Ya. Zhuka.
(Portland cement--Testing)

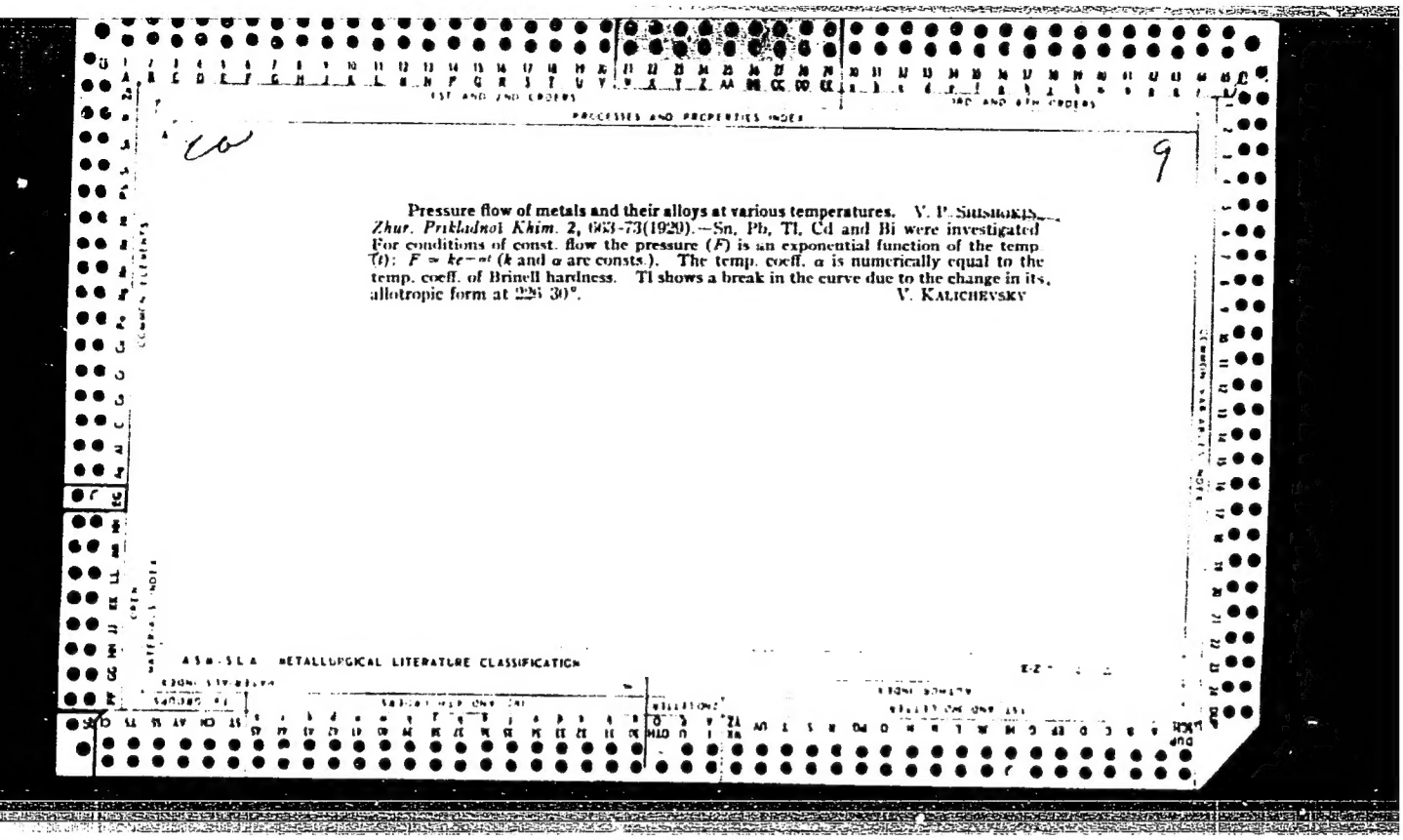
SHISHOKIN, S.A.

Some results of field tests in the prevention of ice formation by use of compressed air. Izv. AN Kazakh. SSR. Ser. energ. no.1: 97-105 '61. (MIRA 14:12)

(Locks (Hydraulic engineering))
(Compressed air)

SHISHOKIN, S.A.

Method for determining the optimum relationships of the parameters of air blowing systems. Izv. AN Kazakh. SSR. Ser. energ. no.1: 106-110 '61. (MIRA 14:12)
(Kazakhstan—Locks (Hydraulic engineering))
(Compressed air)



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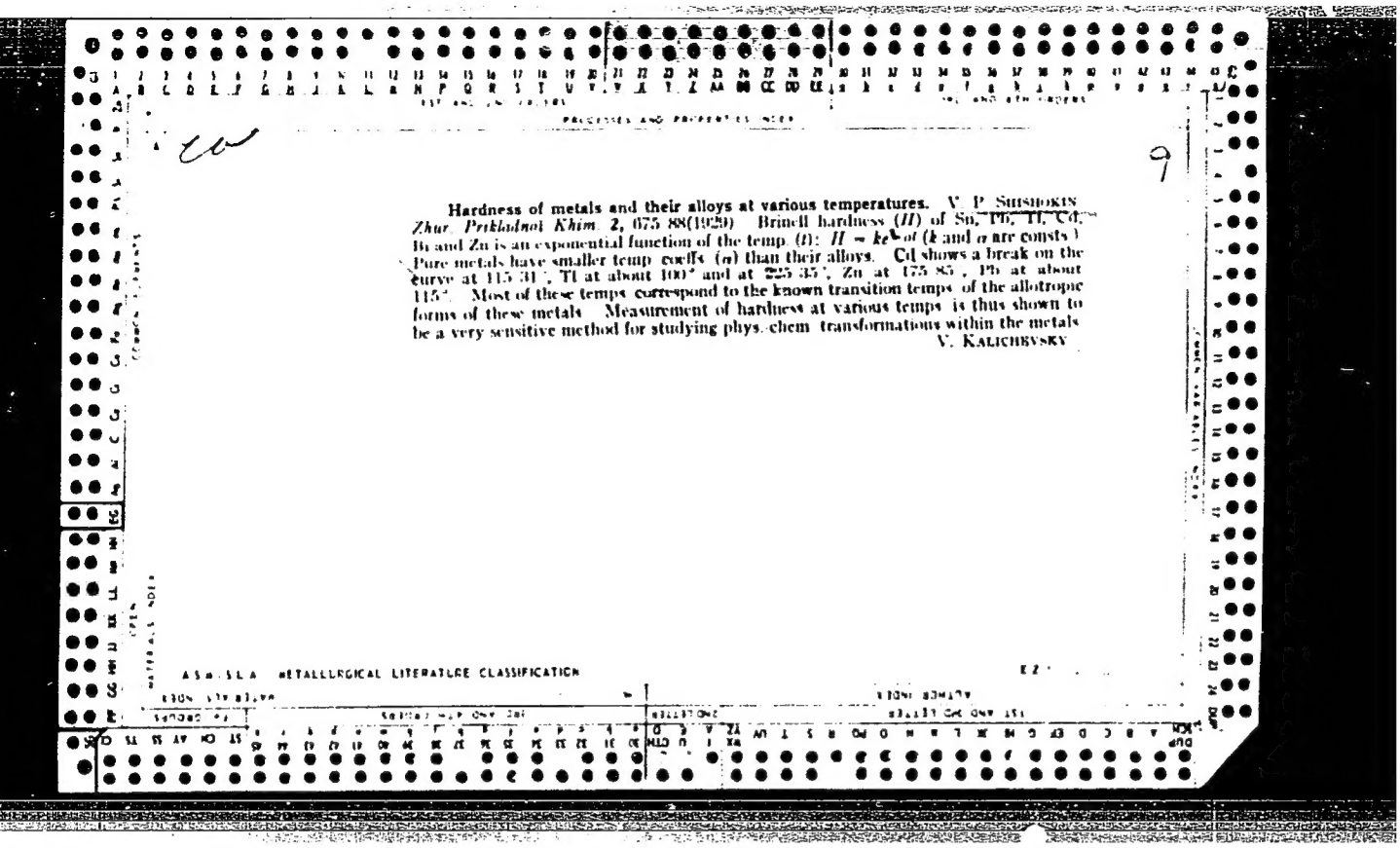
Pressure flow of metals and their alloys at various temperatures. V. P. Sitsiokis. *Zhur. Prikladnoi Khim.* 2, 663-73(1929).—Sn, Pb, Tl, Cd and Bi were investigated. For conditions of const. flow the pressure (F) is an exponential function of the temp. (t): $F = ke^{-\alpha t}$ (k and α are consts.). The temp. coeff. α is numerically equal to the temp. coeff. of Brinell hardness. Tl shows a break in the curve due to the change in its allotropic form at 226.30°. V. Kalichevsky

A S M - S L A METALLURGICAL LITERATURE CLASSIFICATION



Hardness of metals and their alloys at various temperatures. V. P. Sinsiokin. *Zhur. Prikladnoi Khim.* **2**, 675-88(1929). Brinell hardness (*H*) of Sn, Pb, Tl, Cd, Bi and Zn is an exponential function of the temp. (*t*): $H = ke^{-at}$ (*k* and *a* are consts.) Pure metals have smaller temp. coeffs. (*a*) than their alloys. Cd shows a break on the curve at 115.31°, Tl at about 100° and at 225.35°, Zn at 175.85°, Pb at about 115°. Most of these temps. correspond to the known transition temps. of the allotropic forms of these metals. Measurement of hardness at various temps. is thus shown to be a very sensitive method for studying phys.-chem. transformations within the metals.
V. Kalichevsky.